APPENDIX #1

By TCG Date WEHRAN ENGINEERING Engineers & Scientists Job No. 075
Chkd. by Date Sheet No. 1 of 4
Subject VOLUME CALCULATIONS

PURPOSE: TO DETERMINE ① VOLUME OF MATERIAL AVAILABLE ② LIFE-OF-MINE ③ PHASE VOLUMES

A. DESIRED LEVEL OF ACTIVITY - FROM L. MEHL

1. 20 - 14 CY TRUCKS PER DAY ⇒ 280 CY/D
2. 280 CY/D X 6 DAYS X 50 WEEKS/YR ⇒ 84,000 CY IN TRUCK
3. FROM EXCAVATION HANDBOOK, H.K. CHURCH, MCGRAW-H 1981

SHALE SWELL FACTOR = 1.5

∴ 84000 CY IN TRUCK = 56,000 CY IN PLACE

B. LIFE-OF-MINE

1. FROM SHEET 2, TOTAL CUT = 824,369 CY IN PLA

$$\frac{824{,}369 \text{ CY}}{56{,}000 \text{ CY/YR}} = 14.7 \text{ YEARS}$$

∴ 15 YR LIFE-OF-MINE

C. PHASING:

1. 15 YEARS = 5 - 3 YR (TRIENNIAL) PERMIT PERIODS
2. $\frac{824{,}369 \text{ CY IN PLACE}}{5 \text{ phase}}$ = 164,874 CY IN PLA PER PHASE
3. PHASE I MUST RECLAIM EXISTING MINE ~~AREA~~. SEE SHEET 3

175,777 CY (CUT) - 4,556 CY (FILL) =

171,221 CY NET CUT IN PLACE

1-2

D 3-85 SHEET NO. 2 OF 4

BY DPC / checked ECG

WEHRAN ENGINEERING
CONSULTING ENGINEERS

VOLUME CALCULATION

FINAL GRADING

~~SECTION~~ CONTOUR	RDG. IN^2 ×	AREA $\frac{FT^2}{IN^2}$ 10,000 =	AVERAGES ×	DISTANCE SPACING =	VOLUME CF	VOLUME CY
680	0					
			178500	10	1,785,000	66,111
690	35.70	357,000				
			343,600	10	3,436,000	127,259
700	33.02	330,200				
			303,350	10	3,033,500	112,352
710	27.65	276,500				
			246,750	10	2,467,500	91,389
720	21.70	217,000				
			208,500	10	2,085,000	77,222
730	20.00	200,000				
			197,500	10	1,975,000	73,148
740	19.50	195,000				
			189,500	10	1,895,000	70,185
750	18.40	184,000				
			177,750	10	1,777,500	65,833
760	17.15	171,500				
			152,750	10	1,527,500	56,574
770	13.40	134,000				
			117,000	10	1,170,000	43,333
780	10.00	100,000				
			73,250	10	732,500	27,130
790	4.65	46,500				
			30,300	10	303,000	11,222
800	1.41	14,100				
			7,050	10	70,500	2,611
810	0	0				
					TOTAL	824,369

DATE 2 FEB 07 SHEET NO. 2 OF 3
BY RPC / JLG checked

VOLUME CALCULATION

WEHRAN ENGINEERING
CONSULTING ENGINEERS

PHASE I NC. RECLAM. EXIST. MINE

SECTION	RDG. IN²	X	AREA FT.²/IN.²	=	AVERAGES	X	DISTANCE SPACING	=	VOLUME CF	CY
690	0		0		71,850		10		718,500	26,6
700	14.37		143700		129,850		10		1,298,500	48,0
710	11.60		116,000		89,250		10		892,500	33,0
720	6.25		62,500		53,950		10		539,500	19,9
730	4.54		45,400		43,200		10		432,000	16 0
740	4.10		41,000		37,200		10		372,000	13,7
750	3.34		33,400		28,250		10		282,500	10,4
760	2.31		23,100		16,300		10		163,000	6,0
770	.95		9,500		4,750		10		47,500	1,7
0	0		0							
							TOTAL CUT (CY) =			175,7
700	0		0		650		10		6,500	2
710	.13		1300		4400		10		44,000	16
720	.75		7500		5500		10		55,000	20
730	.35		3500		1750		10		17,500	6
740	0		0							
							TOTAL FILL (CY) =			455

By VLG Date 5/6/08 | WEHRAN ENGINEERING Engineers & Scientists | Job No. 01754

Chkd. by [illegible] Date — | Sheet No. 4 of 4

Subject

PURPOSE: TO ESTABLISH 5 - 3YR PHASES, MAINTAINING PHASE I FOR OLD MINE RECLAMATION

CONTOUR	15YR	- PHASE I	REMAINDER		BREAK
0					
690	66,111	0	66,111	—	
700	127,259	26,611	100,648	✓	
710	112,352	48,092	64,233		700
720	91,389	33,056	58,333	✓	
730	77,222	19,981	57,241	✓	733
740	73,148	16,000	57,148	✓	
750	70,185	13,778	56,407	✓	
760	65,833	10,462	55,370	✓	755
770	56,574	6,037	50537	✓	
780	43,333	1,759	41574	✓	
790	27,130	0	27130	—	
800	11,222	0	11,222	—	
810	2,611	0	2,611	—	
TOTALS	824,369	175,777	648,592		

648,592 ÷ 4 REMAINING PHASES => 162,148 /PH

APPENDIX #2

C-1

By FCG Date 5-3-88 | WEHRAN ENGINEERING Engineers & Scientists | Job No. 07534

Chkd. by Date | Sheet No. 1 of 12

Subject HAULAGEWAY CULVERT SIZING

METHOD: RATIONAL $Q = CIA$

SOURCES: (1) "TIME OF CONCENTRATION OF SMALL DRAINAGE BASINS" p 36, Kirpich, Civil Engineering, Vol 10, No 6, June 1940

(2) "RAINFALL INTENSITY CHARTS" BINGHAMPTON, NY

(3) HYDRAULIC CHARTS FOR THE SELECTION OF HIGHWAY CULVERTS Bureau of Public Roads, Hydraulic Engineering Circular No 5, 1965.

(4) DESIGN CHARTS FOR OPEN CHANNEL FLOW, Federal Highway Administration, Hydraulic Design Series No 1973.

(5) ARCHITECTURAL STANDARDS

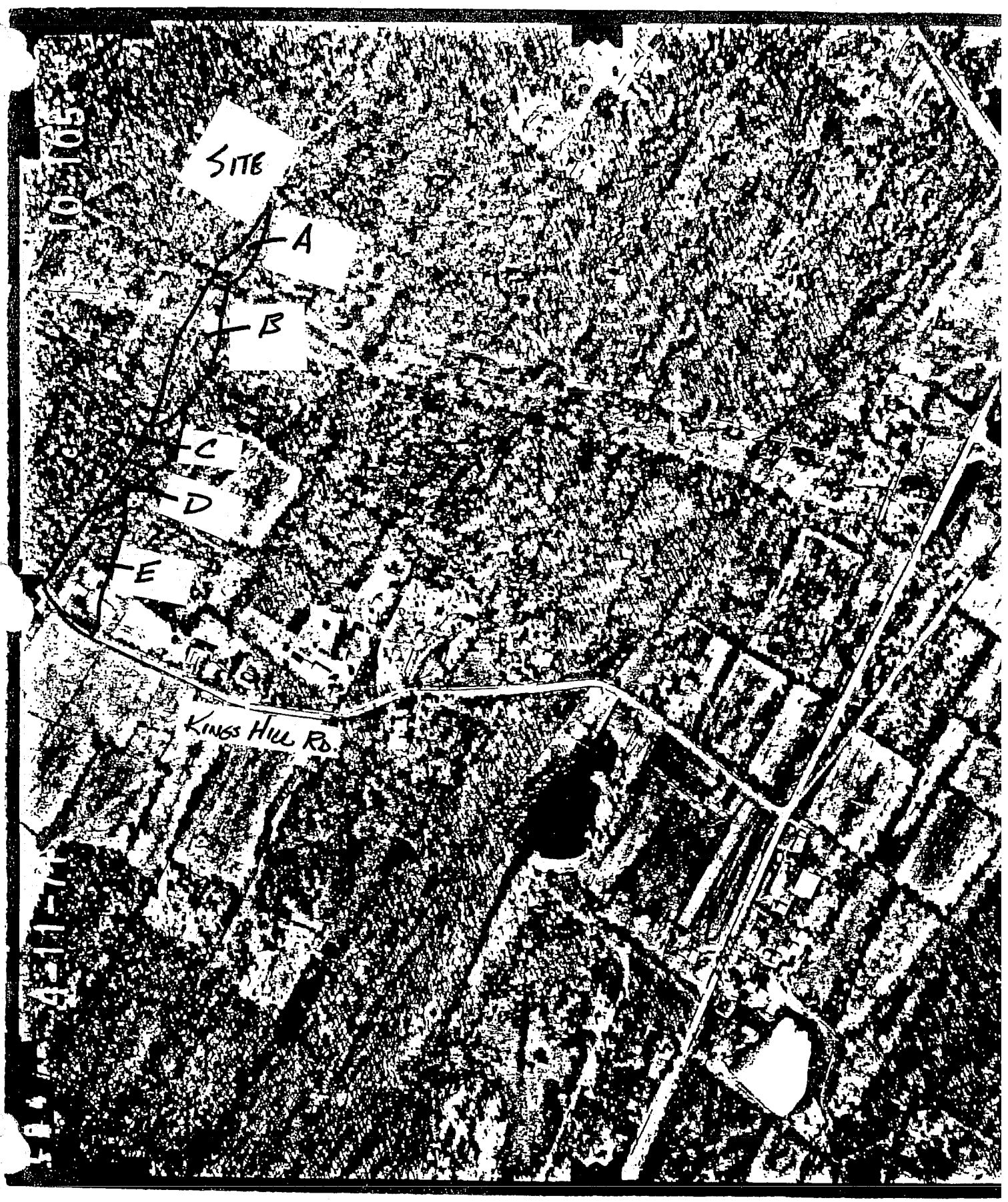
Assumed C values:

WOODED	0.15
RESIDENTIAL	0.35
BRUSH	0.35
PAVEMENT	0.95

STORM FREQUENCY : 25 YR

2-2

1A1



2-3

By GL-SS Date 4/93 WEHRAN ENGINEERING Job No. 07534
Chkd. by VW Date 4-0-93 Engineers & Scientists Sheet No. 2 of 1
Subject AREA CALCULATIONS

1 IN^2 = 250,000 SF

AREA	READINGS IN^2		SF	ACRE
A	.082 .082	.082	20,500	.47
B	.287 .302 .272	.287	71,750	1.65
C	.157 .152 .152	.152	38,000	.87
D	.055 .057	.056	14,000	.32
E	.362 .355 .360	.359	89,750	2.0

By HG Date 5-7-08 WEHRAN ENGINEERING Engineers & Scientists 2-4 Job No. 07524
Chkd. by ___ Date ___ Sheet No. 3 of 13
Subject CULVERT

AREA A

A = .47 Ac dense Brush

C = .35

I: H = 700 - 680 = 20 L = 300' T_c = 2 x 2 = 4 min (1.8, 3.6)

I = 7.0

Q = (.35)(7.0)(.47) = 1.15 c/s ✓

12" CMP. 30' @ 1.0%

AREA A USE 12" MI CMP.

AREA B

A = 1.65 ✓

C = $\frac{(.33)(.35)+(.67)(.15)}{1}$ = 0.22

I: H = 680 - 635 = 45 L = 550' T_c = 3.6 x 2 = 7.2 min

I = 6.3

Q = (.22)(6.3)(1.65) = 2.3 c/s ✓

31"-15" CMP @ 1.0%

AREA B USE 15" CMP MITER

AREA C

A = .32

C = .15

I: H = 640 - 625 = 35 L = 280 T_c = 1.5 x 2 = 3 min

I = 7.0

Q = (.15)(.32)(7.0) = .34 c/s ✓ from Area A use 12" CM MITER

2-5

4/1.

PROJECT: 07534

DESIGNER: FCG

DATE: 6-2-88

HYDROLOGIC AND CHANNEL INFORMATION

Q_1 = 1.15

Q_2 = ____

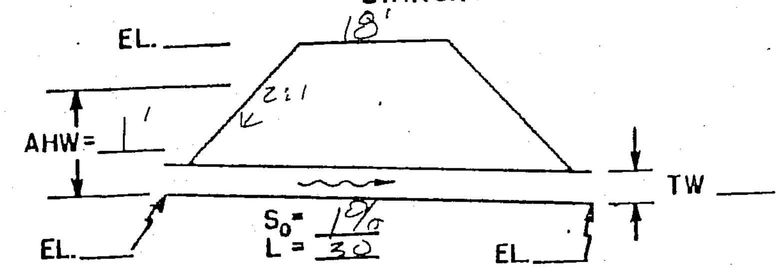
TW_1 = ____

TW_2 = ____

(Q_1 = DESIGN DISCHARGE, SAY Q_{25}
Q_2 = CHECK DISCHARGE, SAY Q_{50} OR Q_{100})

SKETCH

STATION: A ℄ 16+60



MEAN STREAM VELOCITY = ____

MAX. STREAM VELOCITY = ____

HEADWATER COMPUTATION

CULVERT DESCRIPTION (ENTRANCE TYPE)	Q	SIZE	INLET CONT. $\frac{HW}{D}$	INLET CONT. HW	OUTLET CONTROL $HW = H + h_o - LS_o$: K_e	H	d_c	$\frac{d_c+D}{2}$	TW	h_o	LS_o	HW	CONTROLLING HW	OUTLET VELOCITY	COST	COMMENTS
MITERED	1.15	12"	.64	.64	.7	NA					.3			2.5		KW 6/20/88

SUMMARY & RECOMMENDATIONS:

Figure 7

2-6

5/E

PROJECT: 07534

DESIGNER: FCG

DATE: 6-2-88

HYDROLOGIC AND CHANNEL INFORMATION

Q_1 = 2.3

Q_2 = ____

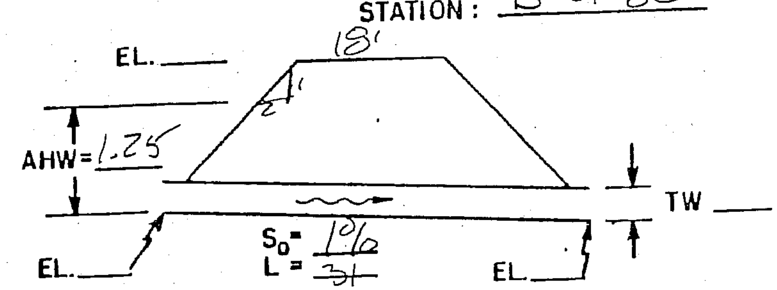
TW_1 = ____

TW_2 = ____

(Q_1 = DESIGN DISCHARGE, SAY Q_{25}
Q_2 = CHECK DISCHARGE, SAY Q_{50} OR Q_{100})

SKETCH

STATION: B ≈9+80



MEAN STREAM VELOCITY = ____

MAX. STREAM VELOCITY = ____

CULVERT DESCRIPTION (ENTRANCE TYPE)	Q	SIZE	HEADWATER COMPUTATION: INLET CONT. HW/D	HW	OUTLET CONTROL HW=H + h_o − LS_o: K_e	H	d_c	$\frac{d_c+D}{2}$	TW	h_o	LS_o	HW	CONTROLLING HW	OUTLET VELOCITY	COST	COMMENTS
MITERED	2.3	15	.71	.89	NA									3		

SUMMARY & RECOMMENDATIONS:

Figure 7

AREA D (combined E+D - grade road ditch)

A- 2.06 + .32 = 2.38

C = .25(.35) + .70(0.15) + .05(.95) = .24

I: H = 635 - 597 = 38 L = 750 T_c ≈ 5

I = 7.0

$Q = (.24)(7.0)(2.38) = 4$ cfs ✓

PROJECT: 07534

DESIGNER: FG

DATE: 6-2-88

HYDROLOGIC AND CHANNEL INFORMATION

Q_1 = 4

Q_2 = _____

TW_1 = _____

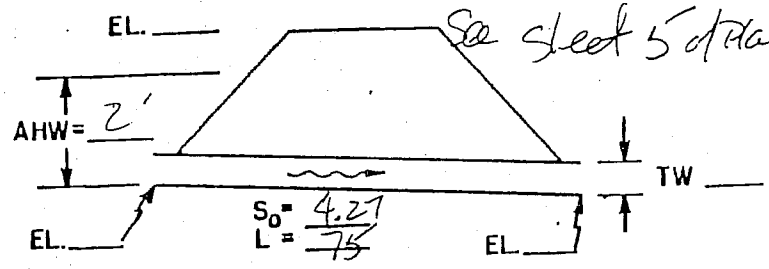
TW_2 = _____

(Q_1 = DESIGN DISCHARGE, SAY Q_{25}
Q_2 = CHECK DISCHARGE, SAY Q_{50} OR Q_{100})

SKETCH

STATION: D 0+30

See sheet 5 of data



MEAN STREAM VELOCITY = _____

MAX. STREAM VELOCITY = _____

CULVERT DESCRIPTION (ENTRANCE TYPE)	Q	SIZE	HEADWATER COMPUTATION										CONTROLLING HW	OUTLET VELOCITY	COST	COMMENTS
			INLET CONT.		OUTLET CONTROL $HW=H+h_o-LS_o$											
			$\frac{HW}{D}$	HW	K_e	H	d_c	$\frac{d_c+D}{2}$	TW	h_o	LS_o	HW				
MITER	4	18	.74	1.11	NA									5.9		⇒

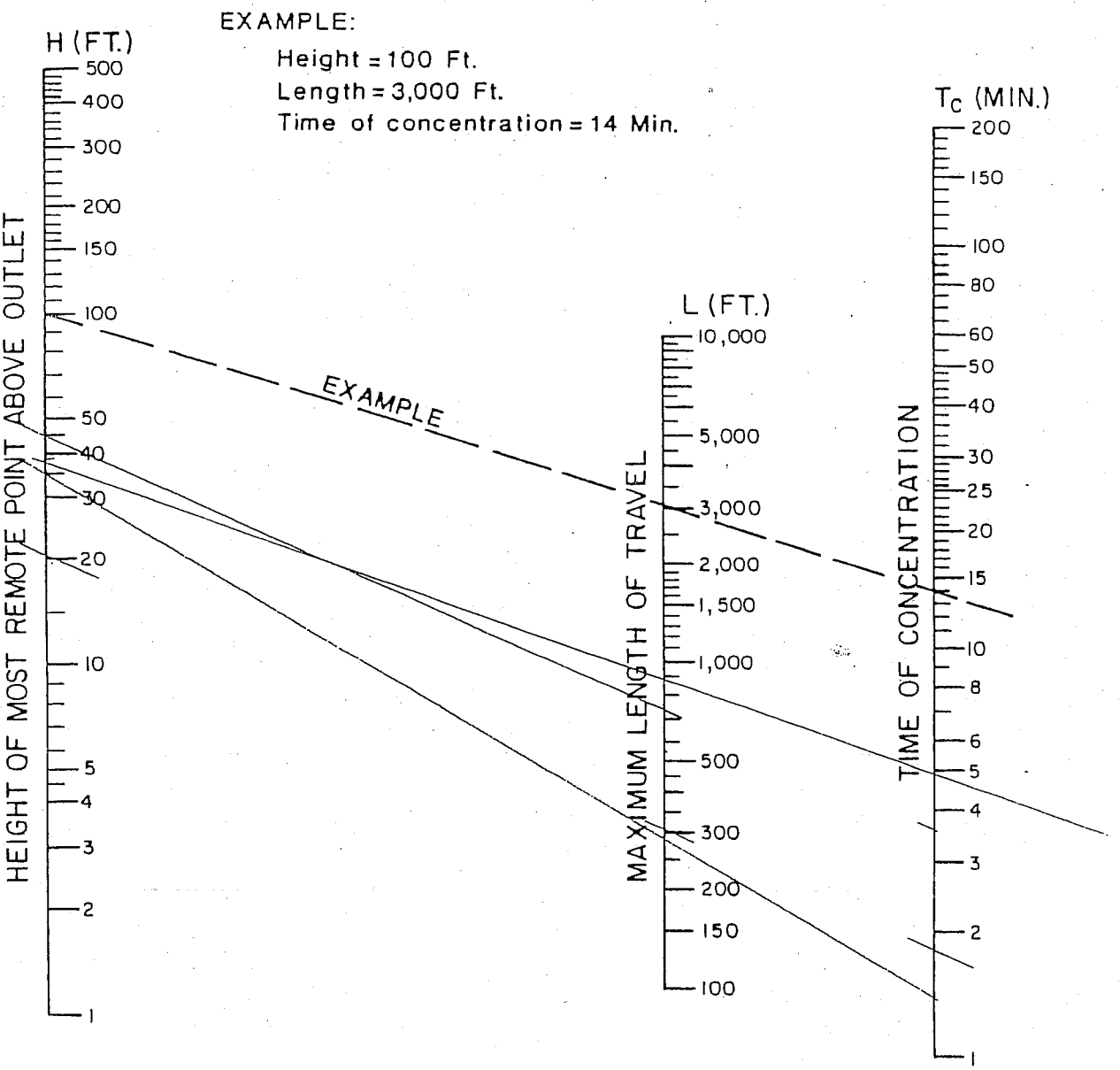
SUMMARY & RECOMMENDATIONS:

5-18

Figure 7

TIME OF CONCENTRATION OF SMALL DRAINAGE BASINS

2-9 8/13



Note: 1) Use nomograph Tc for natural basins with well defined channels, for overland flow on bare earth, and for mowed grass roadside channels.

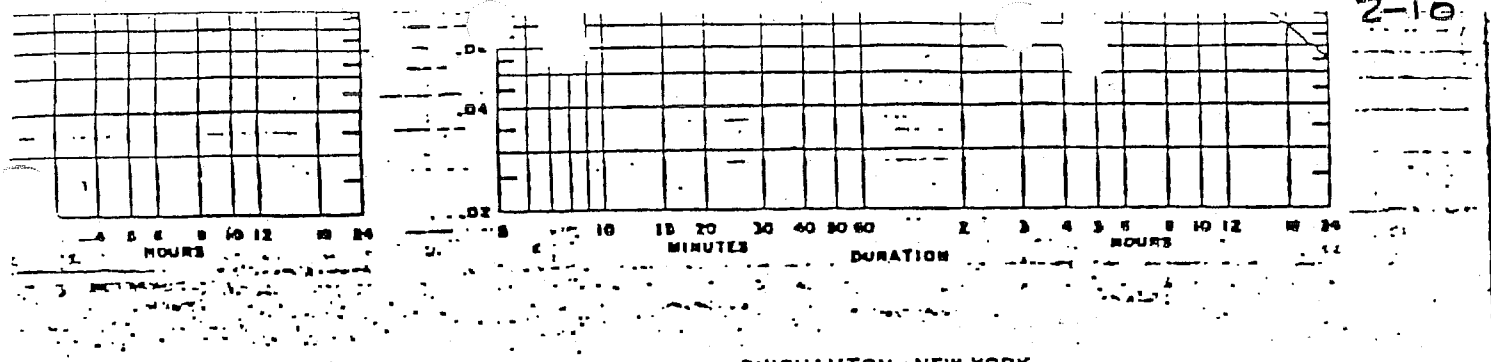
2) For overland flow, grassed surfaces, multiply Tc by 2.

3) for overland flow, concrete or asphalt surfaces, multiply Tc by 0.4.

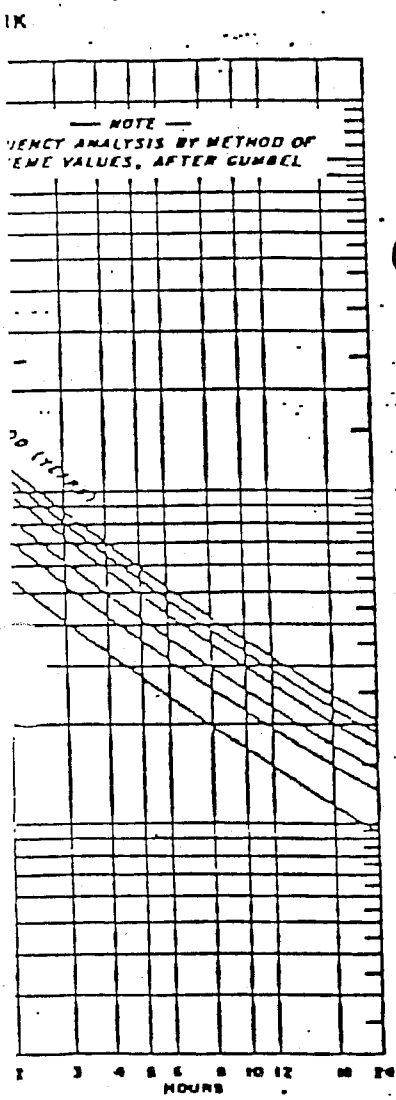
4) For concrete channels, multiply Tc by 0.2.

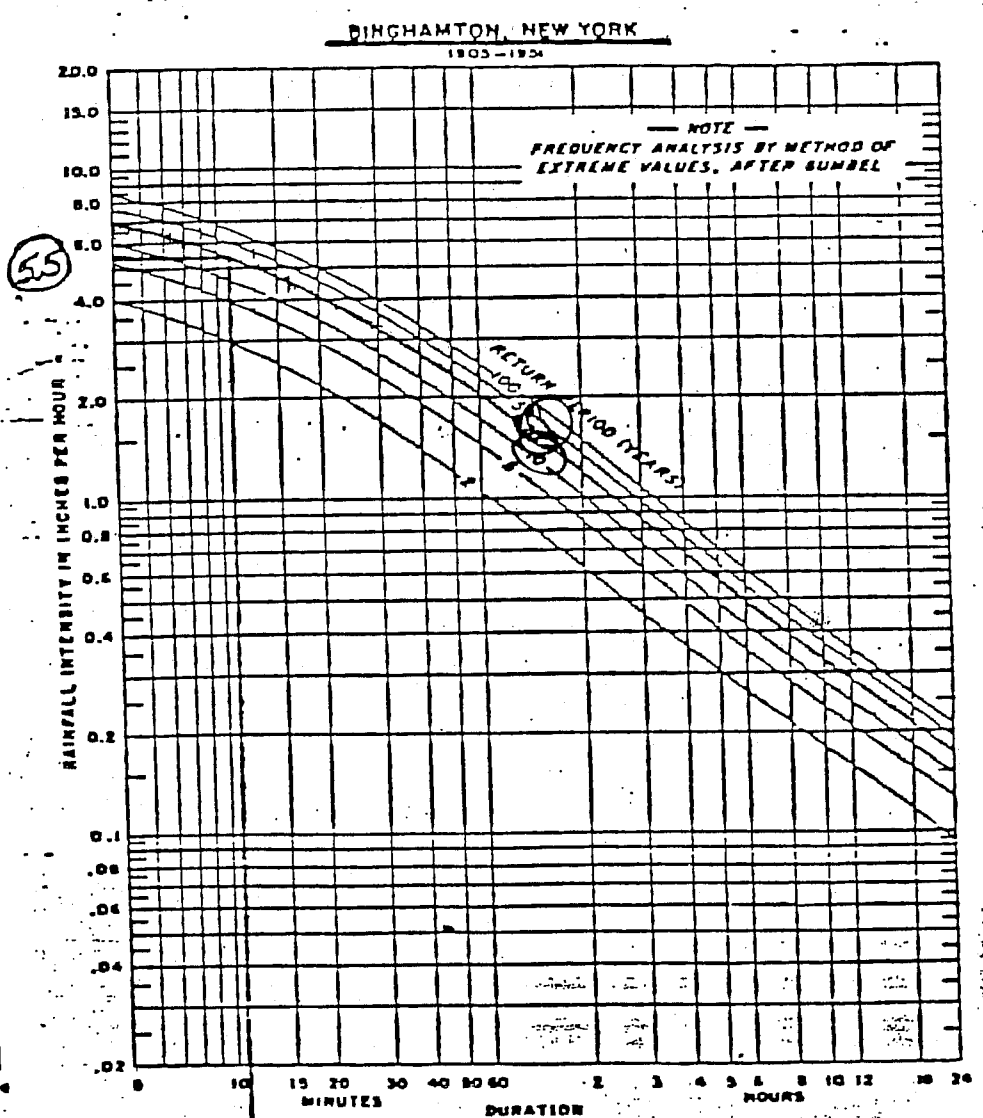
Reference: Based on study by P.Z.Kirpich, Civil Engineering, Vol. 10, No. 6. June 1940. p. 362.

2-10



IK





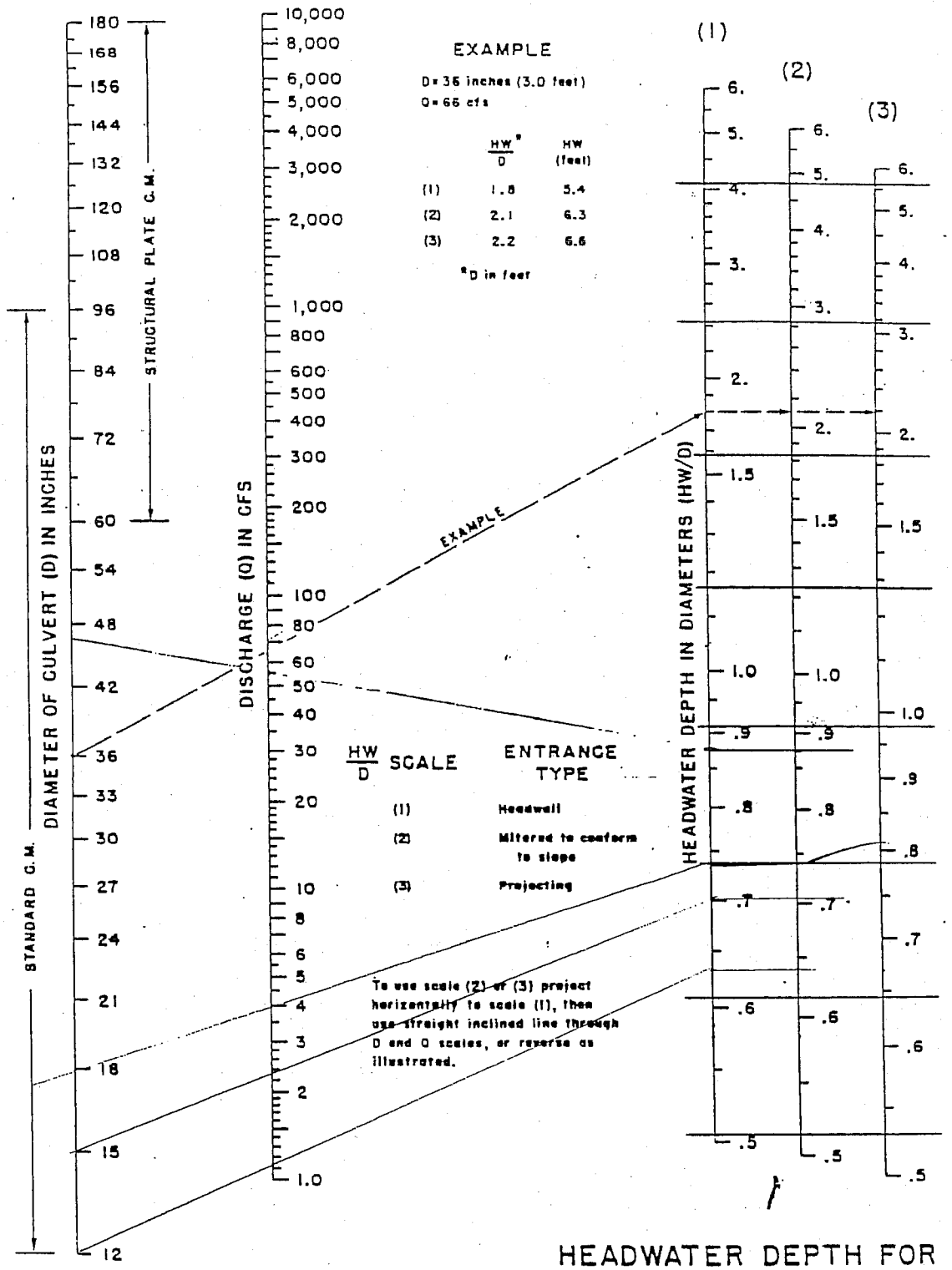
55

~ 11.3

25YR STORM

30

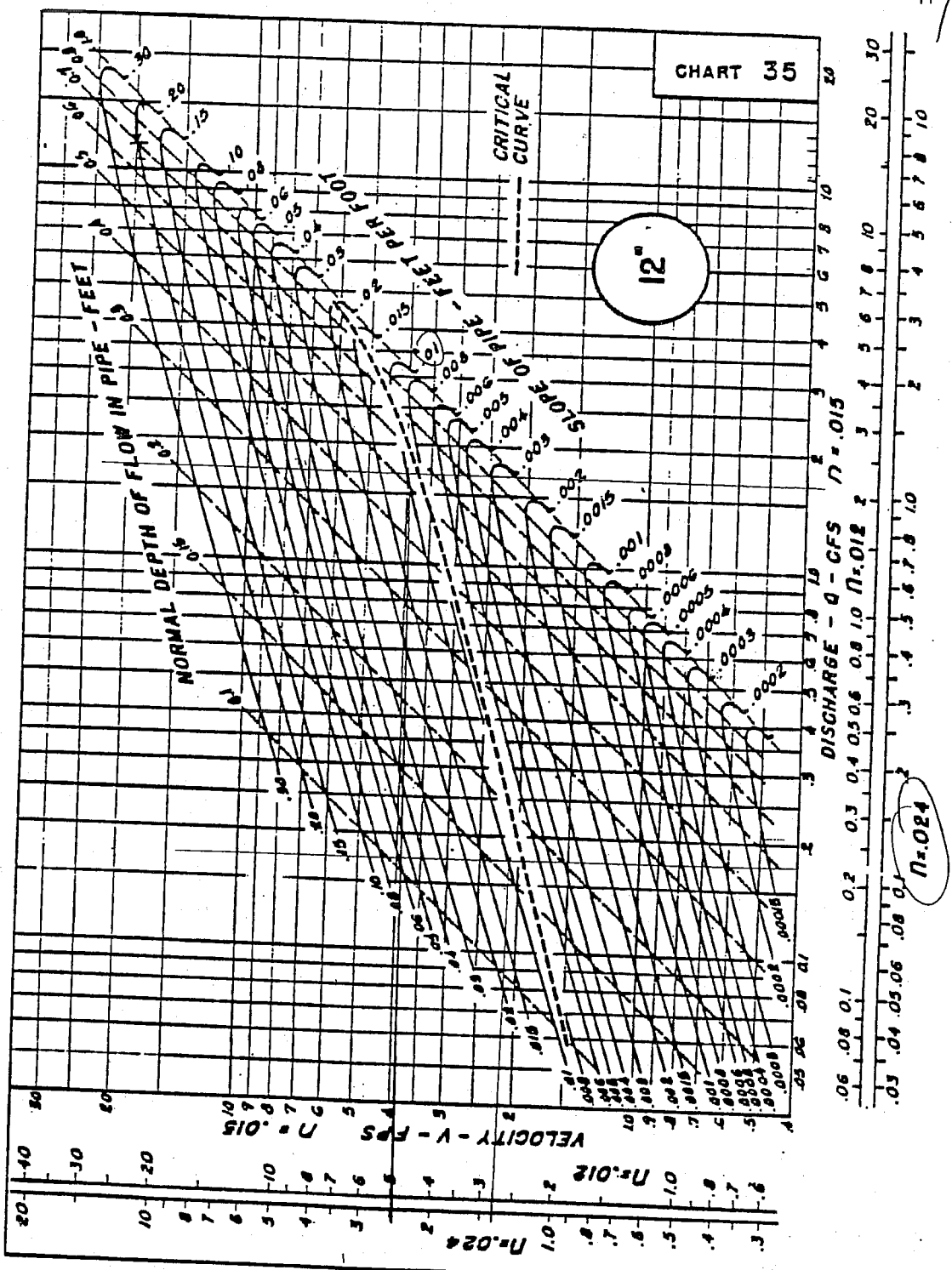
CHART 5 2-11 10/1



HEADWATER DEPTH FOR C. M. PIPE CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

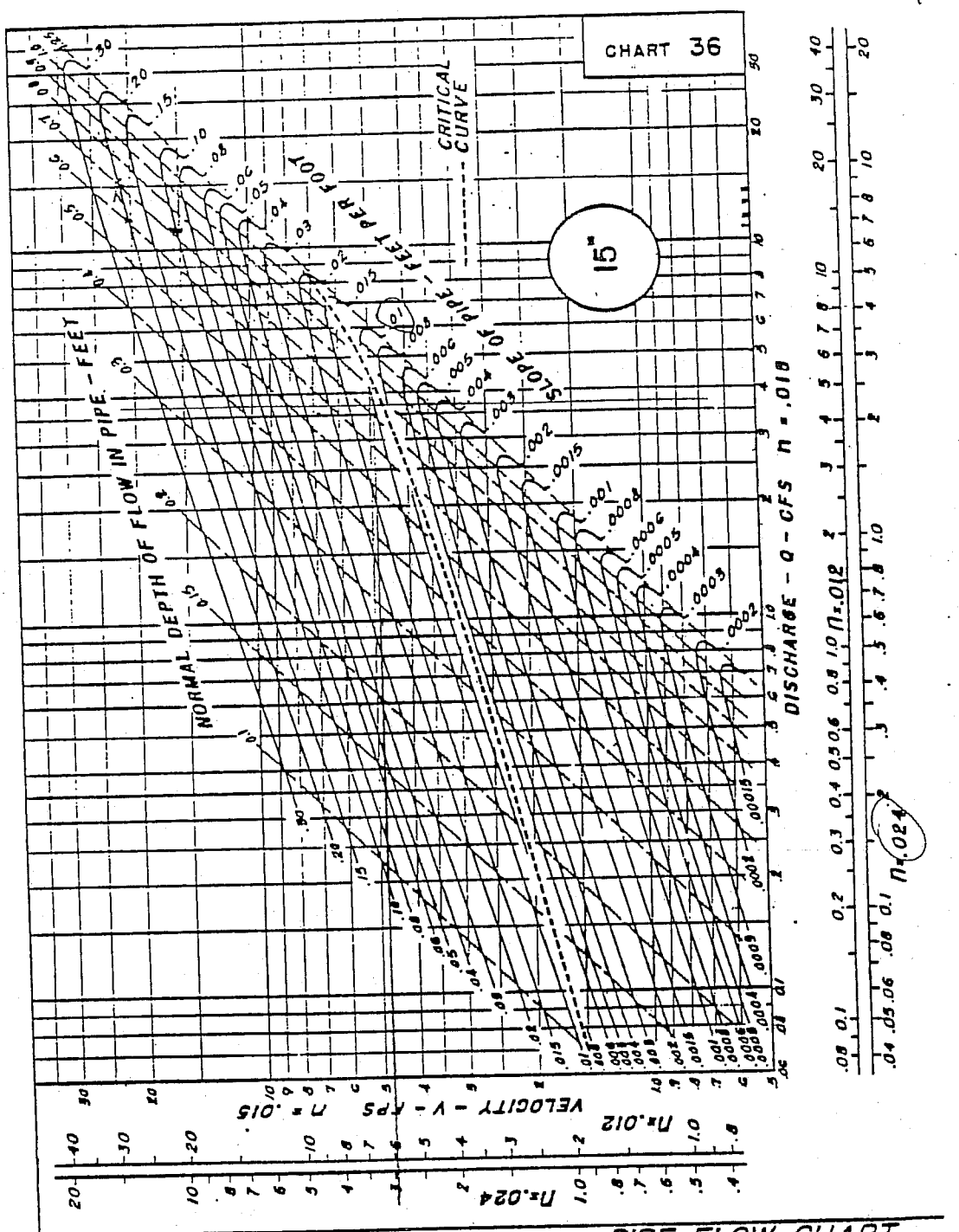
2-12



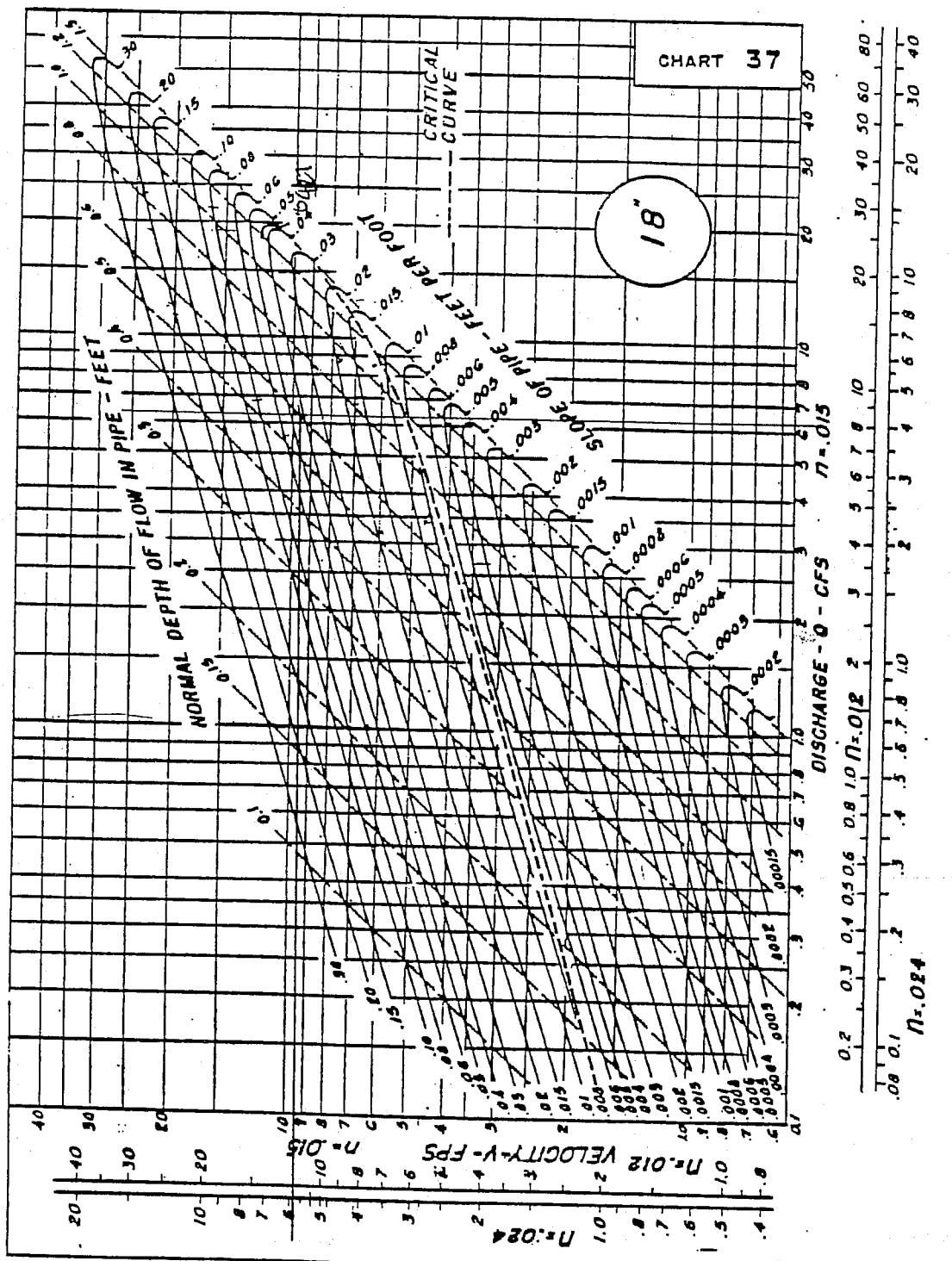
PIPE FLOW CHART
12-INCH DIAMETER

2-13

12/13



PIPE FLOW CHART
15-INCH DIAMETER



PIPE FLOW CHART
18-INCH DIAMETER

APPENDIX #3

Drainage Report
For
Mehlon Trucking, Inc.
Kings Hill Road Shale Mine
Town of Montgomery,Orange County, New York

Prepared By:
Darren C. Doce, PE
13 New Road, Newburgh, NY 12550
Date: March 12, 2003

Introduction

The project consists of a 17.3-acre shale mine located on a 159.9-acre parcel on the north side of Kings Hill Road in the Town of Montgomery, Orange County, New York. The project site contains woodlands, brushland and an existing shale mine. Approximately 60% of the site is vegetated with deciduous forest, brush and shrubs. The remaining 40 % is devoid of vegetation. Soils at the project site consist of Bath-Nassau shaly silt loam and Rock outcrop-Nassau complex shaly silt loam.

The site will be developed as a shale mine in five phases. This will limit the amount of disturbed area at any one time. As mining progresses through the phases, the previous phase will be reclaimed. During the Phase II, approximately 11 acres of previously vegetated land will be exposed shale. This was determined to be the greatest area exposed at any one time.

The purpose of this report is to analyze the effects development would have on storm water runoff flow rates. A detention basin will be designed to collect and manage storm water runoff from this project during the mining activity. After mining is complete the area will be reclaimed and the detention basin eliminated. Erosion and sediment control measure will be designed to lessen impacts on the site due to the mining activity.

Existing Conditions

At present the parcel is 60% vegetated and 40% exposed shale and soil. The project site is located on the easterly property line of the overall parcel along the crest of a ridge. Runoff to the east of the site flows in an easterly direction away from the project area. Runoff from the project area flows overland in a westerly direction through the remainder of the parcel and is eventually discharged onto adjacent lands to the west. A small portion (0.75 acres) of the overall parcel north of the project drains toward the 17.3-acre mine site. Runoff from this area will be diverted away from the mine. Runoff from the remainder of the 159.9 acre parcel flows in a westerly direction and will not enter the project area.

Proposed Conditions

After development, the site will be reclaimed and revegetated. The parcel will be graded to its approximate existing slopes so that runoff continues to flow overland in a westerly direction. Runoff flow rates and drainage patterns will not be significantly altered. During the mining activity, at any one time, approximately 11 acres of previously vegetated land will be exposed. Runoff flow rates will be increased as a result of this area being exposed. There is an existing detention basin located in the southerly section of the mine site. This basin will be slightly modified to detain the increase in runoff flow rates due to development and release them at pre-development flow rates. During reclamation of the entire site this area win also be reclaimed. The detention basin was designed to accommodate runoff associated with the 10-year storm events. The

outlet from the basin will be a 21-inch HDPE culvert. There will be a level spreader constructed at the outlet of the culvert to return the concentrated flows to sheet flows.

Runoff Flow Rates

The pre- and post- development runoff flow rates from the site before reclamation were calculated and are shown below. The pre-development runoff flow rate was calculated assuming the catchment area was woodland. Phase II was determined to be the phase which resulted in the greatest increase in runoff flow rate. The post-development flow rate is the rate from Phase II routed through the detention basin.

Storm Event	Pre-development Runoff Flow Rate	Post-development Runoff Flow Rate ("Worst Case Phase II")
10yr.	20.1 cfs	18.7 cfs

Erosion and Sediment Control

Prior to developing the mine, diversion swales will be placed upstream of the phase actively being mined. These swales will divert storm water away from the disturbed areas to level spreaders. The level spreaders will convert the concentrated runoff from the swales to sheet flow and release the runoff over a stable area. The diversion swales for each phase will remain in place until final reclamation to lessen overland flow distances and direct runoff to sediment trapping devices. A stone sediment trap will precede each level spreader to remove any sediment in the runoff.

Prior to site disturbance, silt fences will be placed downslope of disturbed areas. The silt fences will reduce runoff velocity and remove sediment from the runoff before it exits the project site. Silt fences will be placed at the toe of slopes of reclaimed areas prior to final grading and seeding. Silt fences will also be placed around the perimeter of all stockpiles.

The erosion and sediment control measure will remain in place until the areas are stabilized and vegetation is established. All measures will be inspected following each runoff producing rainfall and at least once a week. Any repairs will be made immediately.

Conclusion

As a result of the procedures outlined above, storm water runoff and erosion will be managed during the site's development. Therefore, there will be no adverse downstream impacts on properties or structures due to the development and reclamation of the mine site.

Calculations to size detention basin:
Design Storm: 10 year
Soils: Bath-Nassau shaly silt loams (BnB) and Rock outcrop-Nassau complex (RSD)
Hydrologic Soil Group: C
Land Cover Description: Pre-development - woods
Post-development – shale and reclaimed seeded areas

Phase	Area (acres)	Area Contributing Runoff to Detention Basin (acres)	Exposed Shale Area During Phase (acres)
I	9.5	9.5	9.5
II	2.3	12.3	10.7
III	1.8	12.3	10.7
IV	1.8	10.9	9.8
V	9.8	8.6	8.6
Total Site	17.3	NA	NA

Pre-development runoff flow rate: 20.05 cfs
Post development runoff flow rate: 50.73 cfs
(Phase II worst case scenario)
Post-development runoff flow: 18.69 cfs
(routed through detention basin)

Data for **MEHLON TRUCKING DETENTION**
TYPE III 24-HOUR RAINFALL= 5.5 IN
Prepared by DOCE ASSOCIATES
HydroCAD

SUBCATCHMENT **MEHLON PRE-DEVELOPMENT**

PEAK= 20.05 CFS @ 12.23 HRS, VOLUME= 1.95 AF

ACRES	CN	
9.50	73	WOODS

SCS TR-20 METHOD
TYPE III 24-HOUR
RAINFALL= 5.5 IN
SPAN= 10-20 HRS, dt=.1 HRS

Method	Comment	Tc (min)
TR-55 SHEET FLOW	**AB**	16.3
Woods: Light underbrush n=.4 L=150' P2=3.5 in s=.08 '/'		
SHALLOW CONCENTRATED/UPLAND FLOW	**BC**	3.2
Unpaved Kv=16.1345 L=980' s=.1 '/' V=5.1 fps		
	Total Length= 1130 ft	Total Tc= 19.5

SUBCATCHMENT 1 RUNOFF PEAK= 20.05 CFS @ 12.23 HOURS

HOUR	0.00	.10	.20	.30	.40	.50	.60	.70	.80	.90
10.00	.28	.32	.36	.40	.45	.51	.57	.63	.70	.77
11.00	.84	.93	1.04	1.19	1.37	1.59	1.90	2.58	3.89	5.83
12.00	9.13	15.30	19.78	18.75	15.47	12.32	9.34	6.93	5.39	4.48
13.00	3.87	3.41	3.08	2.87	2.72	2.61	2.52	2.43	2.34	2.25
14.00	2.16	2.08	2.00	1.94	1.89	1.84	1.80	1.75	1.71	1.67
15.00	1.62	1.58	1.54	1.49	1.45	1.40	1.36	1.31	1.27	1.22
16.00	1.18	1.13	1.10	1.06	1.04	1.02	1.00	.98	.96	.94
17.00	.92	.90	.88	.86	.84	.82	.80	.78	.76	.74
18.00	.72	.70	.68	.67	.66	.65	.65	.64	.63	.63
19.00	.62	.62	.61	.60	.60	.59	.59	.58	.57	.57
20.00	.56									

3-6

Data for **MEHLON TRUCKING DETENTION**
TYPE III 24-HOUR RAINFALL= 5.5 IN
Prepared by DOCE ASSOCIATES
HydroCAD

SUBCATCHMENT 2 **MEHLON PHASE II POST-DEV** WITHOUT DETENTION BASE USED AS WORST CASE SCENARIO

PEAK= 50.73 CFS @ 12.03 HRS, VOLUME= 3.60 AF

ACRES	CN	
10.70	88	SHALE/DIRT
1.60	74	RECLAIMED SEEDED
12.30	86	

SCS TR-20 METHOD
TYPE III 24-HOUR
RAINFALL= 5.5 IN
SPAN= 10-20 HRS, dt=.1 HRS

Method	Comment	Tc (min)
TR-55 SHEET FLOW	**ab**	.5
Smooth surfaces n=.011 L=125'	P2=3.5 in s=.25 '/'	
SHALLOW CONCENTRATED/UPLAND FLOW	**BC**	5.1
Paved Kv=20.3282 L=1400'	s=.05 '/' V=4.55 fps	
	Total Length= 1525 ft	Total Tc= 5.6

SUBCATCHMENT 2 RUNOFF PEAK= 50.73 CFS @ 12.03 HOURS

HOUR	0.00	.10	.20	.30	.40	.50	.60	.70	.80	.90
10.00	1.70	1.81	1.93	2.06	2.20	2.34	2.48	2.62	2.77	2.93
11.00	3.10	3.44	3.90	4.39	4.90	5.65	8.57	13.08	18.09	25.52
12.00	49.63	42.22	26.09	19.87	14.59	9.54	7.14	6.42	5.86	5.30
13.00	4.76	4.46	4.30	4.15	4.01	3.86	3.72	3.57	3.42	3.28
14.00	3.13	3.03	2.96	2.89	2.82	2.75	2.68	2.61	2.54	2.47
15.00	2.40	2.32	2.25	2.18	2.11	2.04	1.97	1.89	1.82	1.75
16.00	1.68	1.63	1.60	1.57	1.54	1.51	1.47	1.44	1.41	1.38
17.00	1.35	1.32	1.29	1.25	1.22	1.19	1.16	1.13	1.10	1.06
18.00	1.03	1.02	1.01	1.00	.99	.98	.97	.96	.95	.94
19.00	.93	.92	.91	.90	.89	.88	.87	.86	.85	.85
20.00	.84									

3-7

Data for **MEHLON TRUCKING DETENTION**
TYPE III 24-HOUR RAINFALL= 5.5 IN
Prepared by DOCE ASSOCIATES
HydroCAD

SUBCATCHMENT **MEHLON PHASE III POST-DEV** WITHOUT DET. BASIN

PEAK= 47.37 CFS @ 12.07 HRS, VOLUME= 3.60 AF

ACRES	CN	
10.70	88	SHALE/DIRT
1.60	74	RECLAIMED SEEDED
12.30	86	

SCS TR-20 METHOD
TYPE III 24-HOUR
RAINFALL= 5.5 IN
SPAN= 10-20 HRS, dt=.1 HRS

Method	Comment	Tc (min)
TR-55 SHEET FLOW	**AB**	.4
Smooth surfaces n=.011 L=100'	P2=3.5 in s=.3 '/'	
SHALLOW CONCENTRATED/UPLAND FLOW	**BC**	7.1
Paved Kv=20.3282 L=1500' s=.03 '/'	V=3.52 fps	
	Total Length= 1600 ft Total Tc=	7.5

SUBCATCHMENT 3 RUNOFF PEAK= 47.37 CFS @ 12.07 HOURS

HOUR	0.00	.10	.20	.30	.40	.50	.60	.70	.80	.90
10.00	1.68	1.78	1.90	2.02	2.16	2.29	2.44	2.58	2.73	2.88
11.00	3.04	3.33	3.77	4.25	4.75	5.38	7.61	11.75	16.61	22.85
12.00	42.62	46.33	29.60	21.77	16.17	10.96	7.72	6.65	6.03	5.46
13.00	4.91	4.53	4.35	4.20	4.05	3.91	3.76	3.61	3.47	3.32
14.00	3.18	3.06	2.98	2.91	2.84	2.77	2.70	2.63	2.56	2.49
15.00	2.42	2.35	2.27	2.20	2.13	2.06	1.99	1.91	1.84	1.77
16.00	1.70	1.64	1.61	1.58	1.55	1.51	1.48	1.45	1.42	1.39
17.00	1.36	1.33	1.29	1.26	1.23	1.20	1.17	1.14	1.11	1.07
18.00	1.04	1.02	1.01	1.00	.99	.98	.97	.96	.95	.94
19.00	.93	.92	.91	.90	.90	.89	.88	.87	.86	.85
20.00	.84									

Data for **MEHLON TRUC...NG DETENTION**
TYPE III 24-HOUR RAINFALL= 5.5 IN
Prepared by DOCE ASSOCIATES
HydroCAD

PHASE II
POST-DEV. ROUTED THROUGH BASIN

POND 1 **DETENTION**

Qin = 50.73 CFS @ 12.03 HRS, VOLUME= 3.60 AF
Qout= 18.69 CFS @ 12.33 HRS, VOLUME= 3.46 AF, ATTEN= 63%, LAG= 18.0 MIN

ELEVATION (FT)	AREA (SF)	INC.STOR (CF)	CUM.STOR (CF)
696.0	12500	0	0
700.0	17000	59000	59000

STOR-IND METHOD
PEAK STORAGE = 51292 CF
PEAK ELEVATION= 699.5 FT
FLOOD ELEVATION= 700.0 FT
START ELEVATION= 696.0 FT
SPAN= 10-20 HRS, dt=.1 HRS
Tdet= 51.4 MIN (3.46 AF)

#	ROUTE	INVERT	OUTLET DEVICES
1	P	696.0'	**21" CULVERT** n=.011 L=150' S=.01'/' Ke=.5 Cc=.9 Cd=.6

POND 1 TOTAL DISCHARGE (CFS) vs ELEVATION

FEET	0.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
696.0	0.00	.06	.23	.51	.89	1.36	1.92	2.56	3.26	4.02
697.0	4.83	5.68	6.55	7.43	8.31	9.15	9.92	10.59	11.13	11.72
698.0	12.28	12.81	13.32	13.82	14.30	14.76	15.20	15.64	16.06	16.47
699.0	16.87	17.27	17.65	18.03	18.39	18.76	19.11	19.46	19.80	20.13
700.0	20.46									

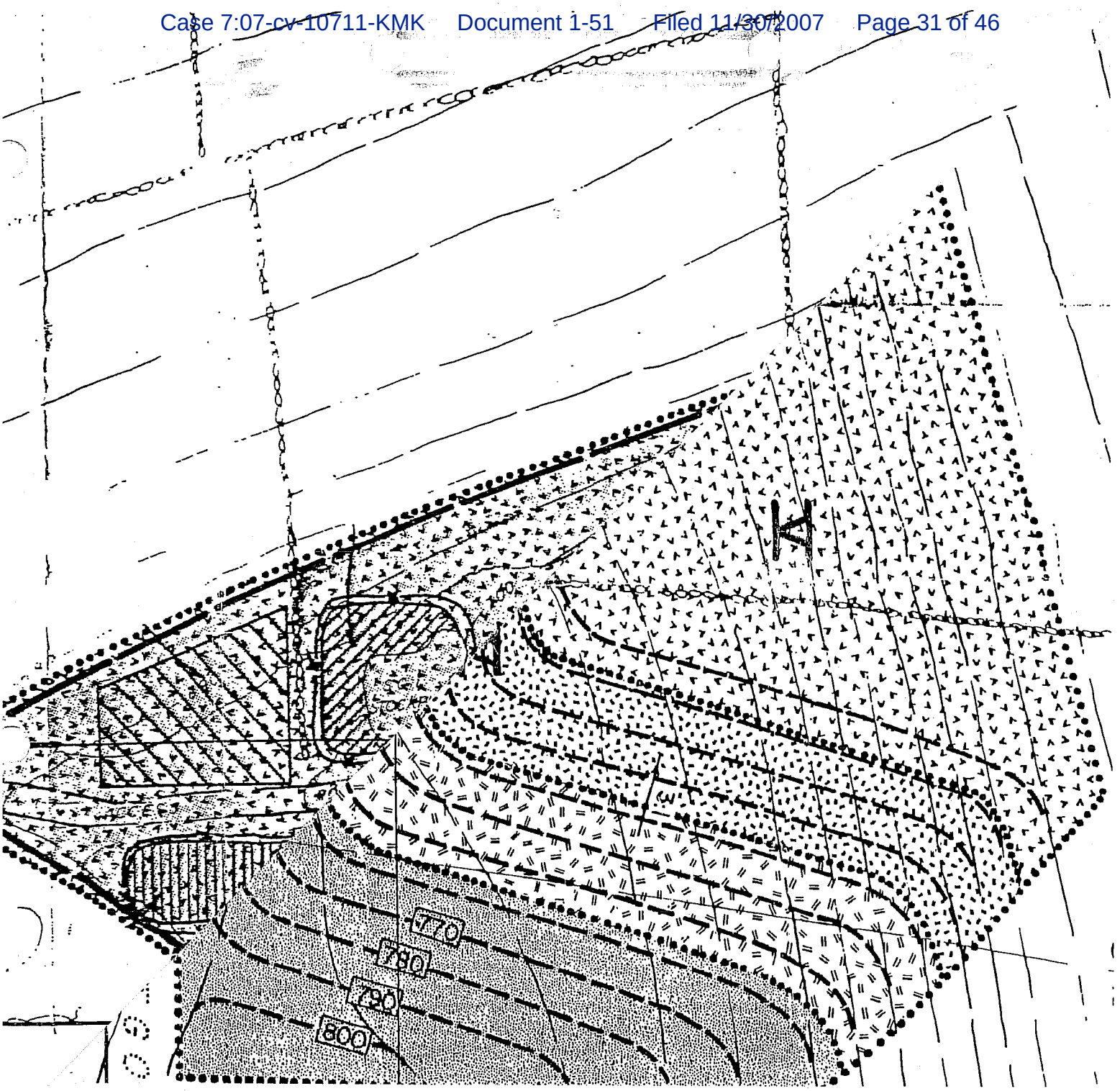
POND 1 INFLOW PEAK= 50.73 CFS @ 12.03 HOURS

HOUR	0.00	.10	.20	.30	.40	.50	.60	.70	.80	.90
10.00	1.70	1.81	1.93	2.06	2.20	2.34	2.48	2.62	2.77	2.93
11.00	3.10	3.44	3.90	4.39	4.90	5.65	8.57	13.08	18.09	25.52
12.00	49.63	42.22	26.09	19.87	14.59	9.54	7.14	6.42	5.86	5.30
13.00	4.76	4.46	4.30	4.15	4.01	3.86	3.72	3.57	3.42	3.28
14.00	3.13	3.03	2.96	2.89	2.82	2.75	2.68	2.61	2.54	2.47
15.00	2.40	2.32	2.25	2.18	2.11	2.04	1.97	1.89	1.82	1.75
16.00	1.68	1.63	1.60	1.57	1.54	1.51	1.47	1.44	1.41	1.38
17.00	1.35	1.32	1.29	1.25	1.22	1.19	1.16	1.13	1.10	1.06
18.00	1.03	1.02	1.01	1.00	.99	.98	.97	.96	.95	.94
19.00	.93	.92	.91	.90	.89	.88	.87	.86	.85	.85
20.00	.84									

Data for **MEHLON TRUCKING DETENTION**
TYPE III 24-HOUR RAINFALL= 5.5 IN
Prepared by DOCE ASSOCIATES
HydroCAD

POND 1 TOTAL OUTFLOW PEAK= 18.69 CFS @ 12.33 HOURS

HOUR	0.00	.10	.20	.30	.40	.50	.60	.70	.80	.90
10.00	.01	.04	.07	.15	.23	.37	.50	.68	.86	1.07
11.00	1.28	1.52	1.80	2.12	2.48	2.92	3.60	4.88	6.92	9.70
12.00	13.36	16.72	18.27	18.67	18.55	18.00	17.14	16.17	15.17	14.16
13.00	13.13	12.09	11.08	10.15	9.13	8.16	7.32	6.61	6.01	5.50
14.00	5.07	4.70	4.40	4.13	3.91	3.72	3.55	3.39	3.25	3.14
15.00	3.02	2.92	2.82	2.72	2.63	2.55	2.47	2.39	2.31	2.24
16.00	2.16	2.09	2.02	1.96	1.90	1.85	1.81	1.76	1.72	1.68
17.00	1.64	1.60	1.56	1.52	1.49	1.45	1.42	1.38	1.35	1.32
18.00	1.29	1.26	1.23	1.21	1.19	1.16	1.14	1.12	1.10	1.09
19.00	1.07	1.05	1.04	1.02	1.01	1.00	.98	.97	.96	.95
20.00	.94									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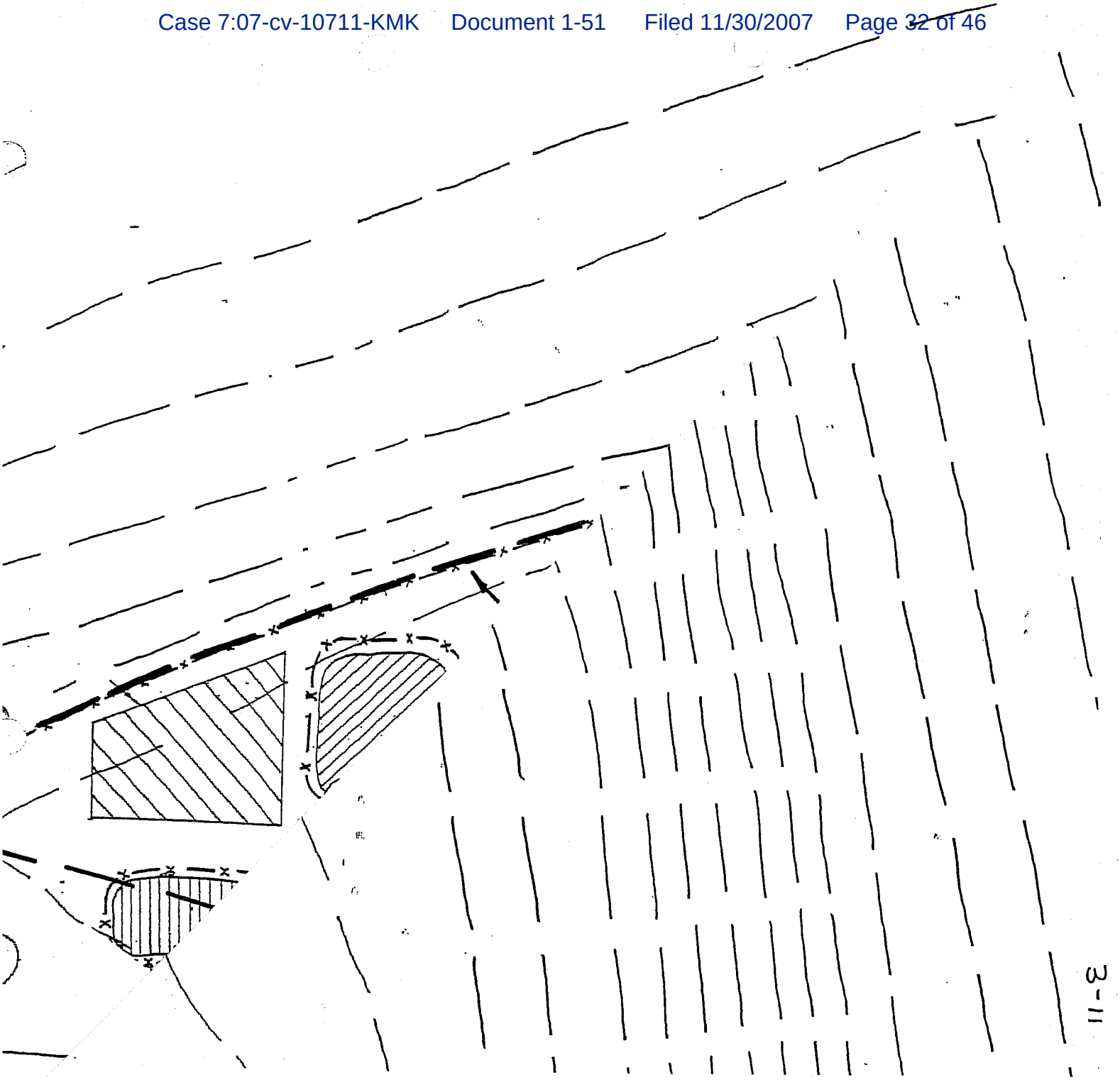

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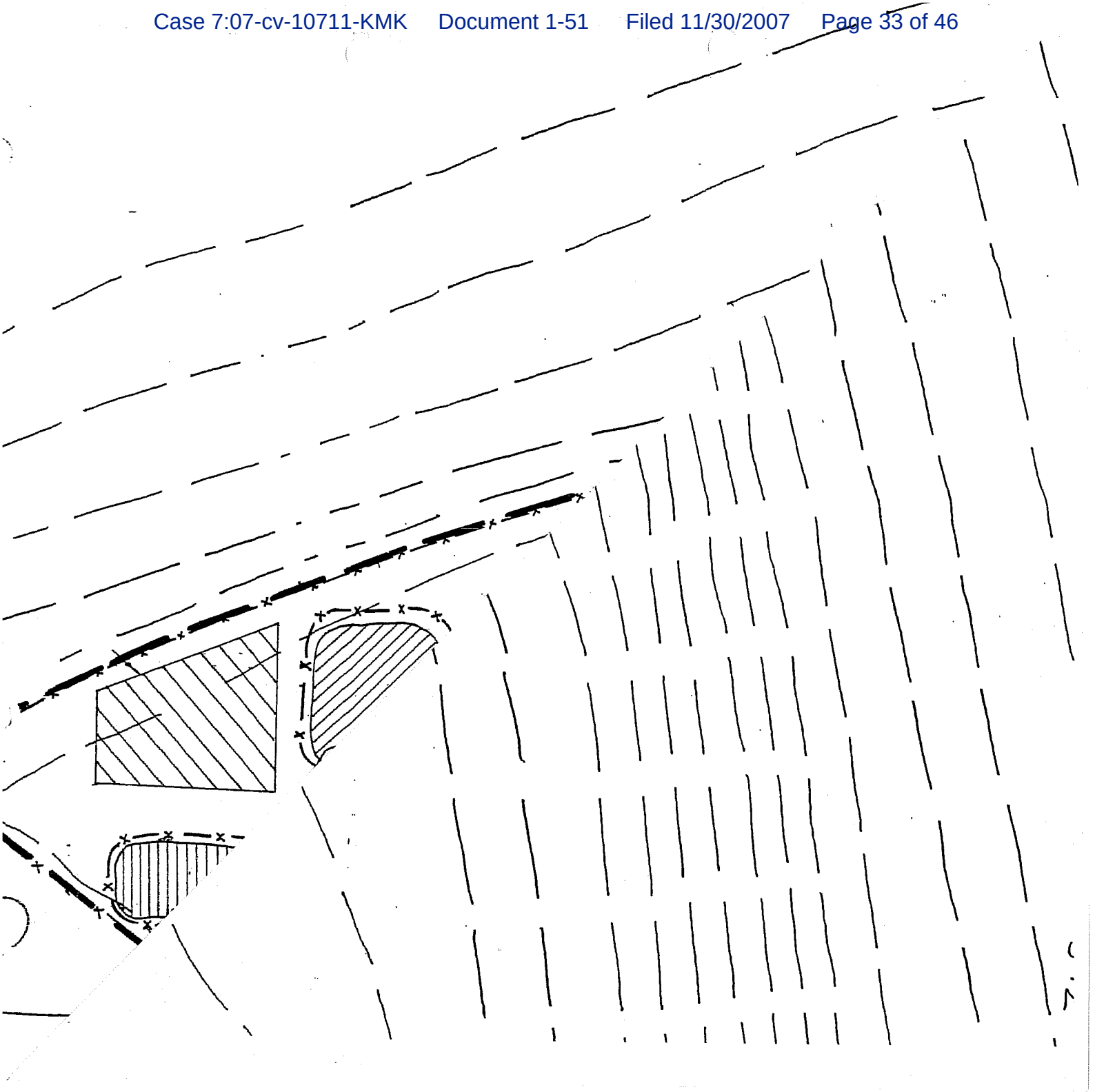

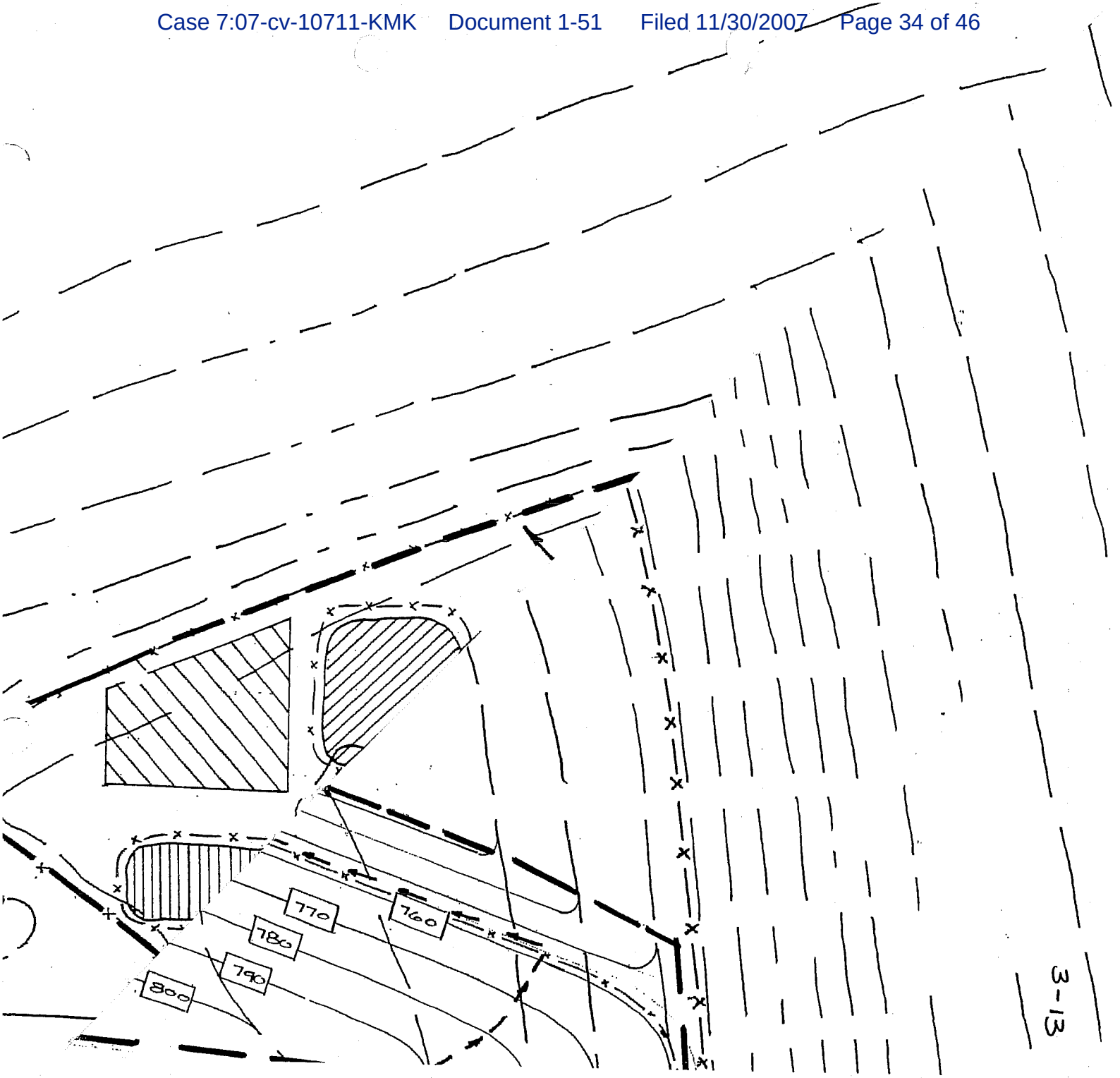

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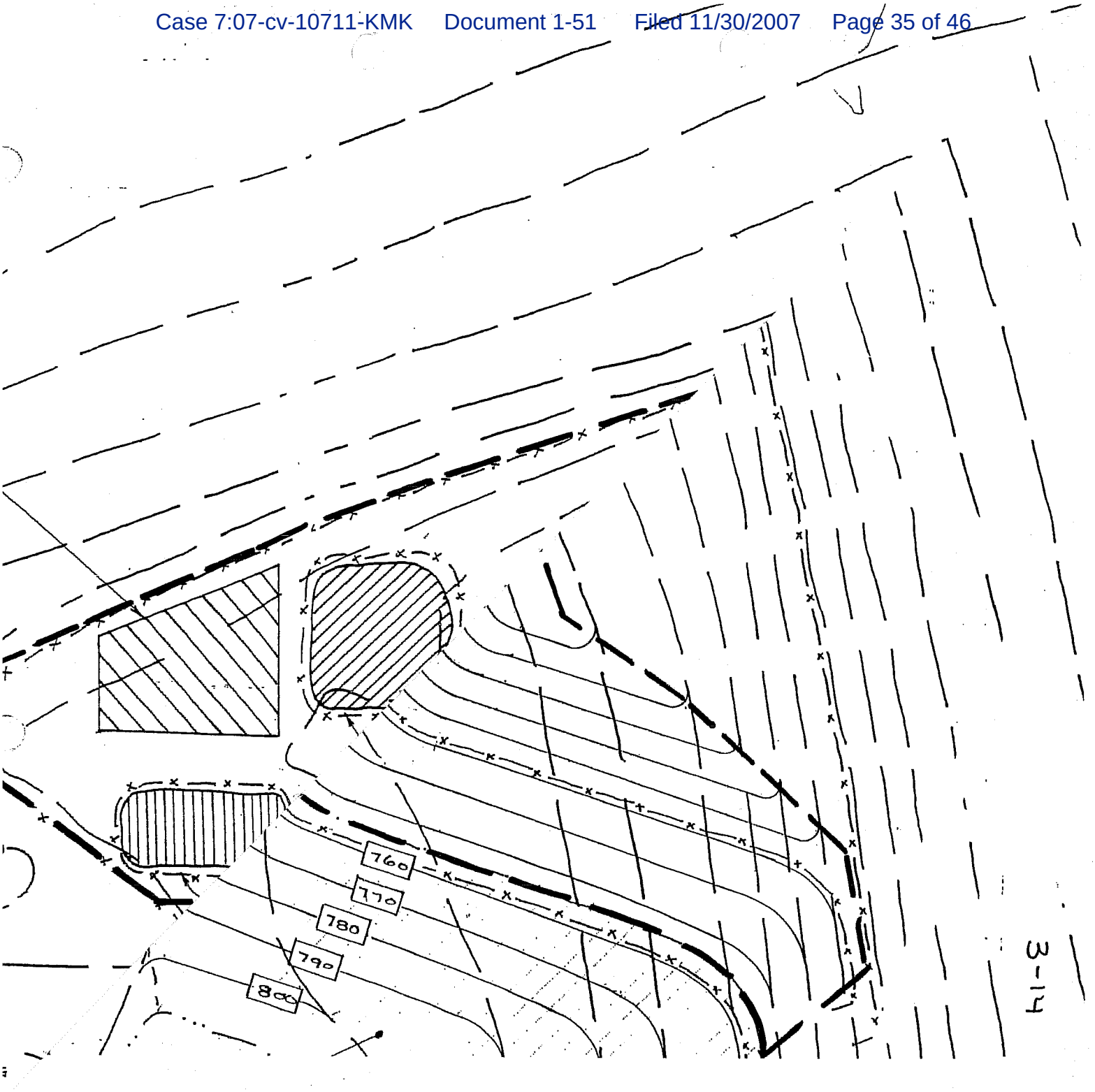
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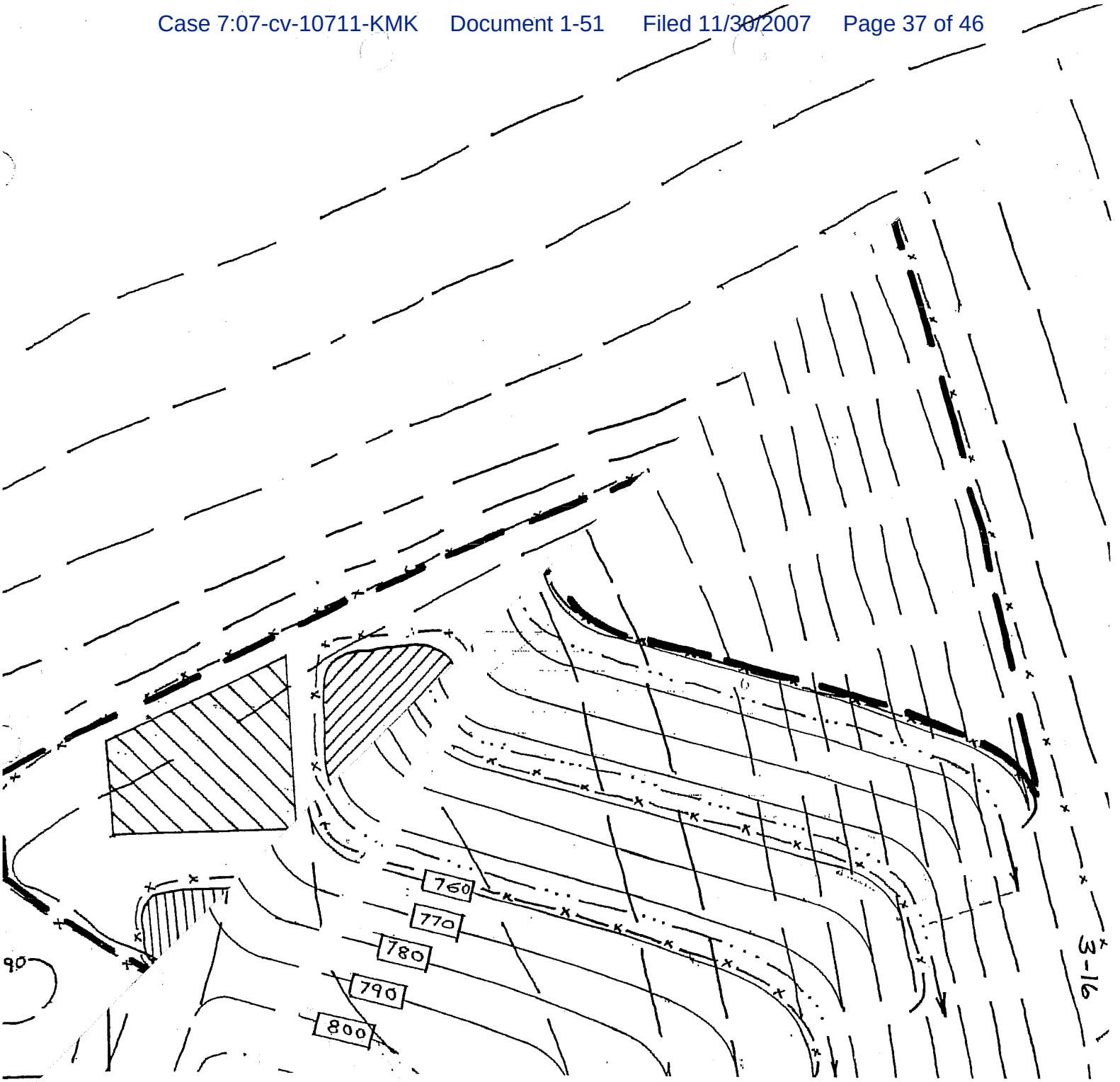
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3-16

Data for MEHLON TRUCKING
TYPE III 24-HOUR RAINFALL= 5.5 IN
Prepared by DOCE ASSOCIATES
HydroCAD

Calculations to size diversion swales:

Soils: Bath-Nassau shaly silt loams (BnB) and Rock outcrop-Nassau complex (RSD)
Hydrologic Soil Group: C
Land Cover Description: woods and grass
Design Storm: 10 year

Area = area contributing runoff to diversion swale

RUNOFF BY SCS TR-20 METHOD: TYPE III 24-HOUR RAINFALL= 5.5 IN, SCS U.H.

PHASE	AREA (ACRE)	Tc (MIN)	--GROUND COVERS (%CN)--			WGT'D CN	C	PEAK (CFS)	Tpeak (HRS)	VOL (AF)
I	.65	15.2	100%73	-	- -	73	-	1.48	12.18	.13
II	.75	17.9	100%73	-	- -	73	-	1.63	12.21	.15
III	2.30	7.0	100%74	-	- -	74	-	6.37	12.07	.49
IV	2.20	4.1	100%74	-	- -	74	-	6.98	12.01	.47
V	2.70	4.1	100%74	-	- -	74	-	8.57	12.01	.57

Data for **MEHLON TRUCKING**
TYPE III 24-HOUR RAINFALL= 5.5 IN
Prepared by DOCE ASSOCIATES
HydroCAD

SUBCATCHMENT **PHASE I**

PEAK= 1.48 CFS @ 12.18 HRS, VOLUME= .13 AF

ACRES	CN	
.65	73	Woods

SCS TR-20 METHOD
TYPE III 24-HOUR
RAINFALL= 5.5 IN
SPAN= 10-20 HRS, dt=.1 HRS

Method	Comment	Tc (min)
TR-55 SHEET FLOW	**AB**	14.9
Woods: Light underbrush n=.4 L=150' P2=3.5 in s=.1 '/'		
SHALLOW CONCENTRATED/UPLAND FLOW	**BC**	.3
Unpaved Kv=16.1345 L=100' s=.1 '/' V=5.1 fps		
	Total Length= 250 ft Total Tc=	15.2

SUBCATCHMENT 1 RUNOFF PEAK= 1.48 CFS @ 12.18 HOURS

HOUR	0.00	.10	.20	.30	.40	.50	.60	.70	.80	.90
10.00	.02	.02	.03	.03	.03	.04	.04	.05	.05	.06
11.00	.06	.07	.08	.09	.10	.12	.15	.22	.33	.49
12.00	.81	1.35	1.47	1.19	.93	.71	.51	.38	.31	.27
13.00	.24	.21	.20	.19	.18	.17	.17	.16	.16	.15
14.00	.14	.14	.13	.13	.13	.12	.12	.12	.12	.11
15.00	.11	.11	.10	.10	.10	.09	.09	.09	.08	.08
16.00	.08	.08	.07	.07	.07	.07	.07	.07	.06	.06
17.00	.06	.06	.06	.06	.06	.06	.05	.05	.05	.05
18.00	.05	.05	.05	.05	.04	.04	.04	.04	.04	.04
19.00	.04	.04	.04	.04	.04	.04	.04	.04	.04	.04
20.00	.04									

3-19

Data for **MEHLON TRUCKING**
TYPE III 24-HOUR RAINFALL= 5.5 IN
Prepared by DOCE ASSOCIATES
HydroCAD

SUBCATCHMENT PHASE II

PEAK= 1.63 CFS @ 12.21 HRS, VOLUME= .15 AF

ACRES	CN	
.75	73	Woods

SCS TR-20 METHOD
TYPE III 24-HOUR
RAINFALL= 5.5 IN
SPAN= 10-20 HRS, dt=.1 HRS

Method	Comment	Tc (min)
TR-55 SHEET FLOW	**AB**	17.2
Woods: Light underbrush n=.4 L=150' P2=3.5 in s=.07 '/'		
SHALLOW CONCENTRATED/UPLAND FLOW	**BC**	.7
Unpaved Kv=16.1345 L=150' s=.05 '/' V=3.61 fps		
	Total Length= 300 ft Total Tc=	17.9

SUBCATCHMENT 2 RUNOFF PEAK= 1.63 CFS @ 12.21 HOURS

HOUR	0.00	.10	.20	.30	.40	.50	.60	.70	.80	.90
10.00	.02	.03	.03	.03	.04	.04	.05	.05	.06	.06
11.00	.07	.07	.08	.10	.11	.13	.16	.22	.33	.50
12.00	.79	1.33	1.63	1.45	1.17	.92	.68	.50	.40	.33
13.00	.29	.26	.24	.22	.21	.20	.20	.19	.18	.18
14.00	.17	.16	.16	.15	.15	.14	.14	.14	.13	.13
15.00	.13	.12	.12	.12	.11	.11	.11	.10	.10	.10
16.00	.09	.09	.09	.08	.08	.08	.08	.08	.08	.07
17.00	.07	.07	.07	.07	.07	.06	.06	.06	.06	.06
18.00	.06	.05	.05	.05	.05	.05	.05	.05	.05	.05
19.00	.05	.05	.05	.05	.05	.05	.05	.05	.05	.04
20.00	.04									

3-20

Data for **MEHLON TRUCKING**
TYPE III 24-HOUR RAINFALL= 5.5 IN
Prepared by DOCE ASSOCIATES
HydroCAD

SUBCATCHMENT **PHASE III**

PEAK= 6.37 CFS @ 12.07 HRS, VOLUME= .49 AF

ACRES	CN	
2.30	74	grass

SCS TR-20 METHOD
TYPE III 24-HOUR
RAINFALL= 5.5 IN
SPAN= 10-20 HRS, dt=.1 HRS

Method	Comment	Tc (min)
TR-55 SHEET FLOW	**AB**	7.0

Grass: Dense n=.24 L=175' P2=3.5 in s=.33 '/'

SUBCATCHMENT 3 RUNOFF PEAK= 6.37 CFS @ 12.07 HOURS

HOUR	0.00	.10	.20	.30	.40	.50	.60	.70	.80	.90
10.00	.10	.11	.12	.14	.15	.17	.19	.20	.22	.24
11.00	.26	.30	.35	.40	.47	.54	.81	1.31	1.94	2.83
12.00	5.76	6.24	4.07	3.09	2.33	1.58	1.13	.99	.91	.82
13.00	.74	.69	.66	.64	.62	.60	.58	.56	.54	.51
14.00	.49	.48	.46	.45	.44	.43	.42	.41	.40	.39
15.00	.38	.37	.36	.35	.34	.32	.31	.30	.29	.28
16.00	.27	.26	.26	.25	.25	.24	.24	.23	.23	.22
17.00	.22	.21	.21	.20	.20	.19	.19	.18	.18	.17
18.00	.17	.16	.16	.16	.16	.16	.16	.15	.15	.15
19.00	.15	.15	.15	.15	.14	.14	.14	.14	.14	.14
20.00	.14									

3-21

Data for **MEHLON TRUCKING**
TYPE III 24-HOUR RAINFALL= 5.5 IN
Prepared by DOCE ASSOCIATES
HydroCAD

SUBCATCHMENT **PHASE IV**

PEAK= 6.98 CFS @ 12.01 HRS, VOLUME= .47 AF

ACRES	CN	
2.20	74	grass

SCS TR-20 METHOD
TYPE III 24-HOUR
RAINFALL= 5.5 IN
SPAN= 10-20 HRS, dt=.1 HRS

Method	Comment	Tc (min)
TR-55 SHEET FLOW	**AB**	4.1

Grass: Dense n=.24 L=90' P2=3.5 in s=.33 '/'

SUBCATCHMENT 4 RUNOFF PEAK= 6.98 CFS @ 12.01 HOURS

HOUR	0.00	.10	.20	.30	.40	.50	.60	.70	.80	.90
10.00	.10	.11	.12	.14	.15	.17	.19	.20	.22	.24
11.00	.26	.30	.36	.41	.47	.58	.96	1.50	2.15	3.39
12.00	6.93	4.95	3.31	2.62	1.90	1.22	.99	.91	.83	.75
13.00	.68	.65	.63	.61	.59	.57	.55	.52	.50	.48
14.00	.46	.45	.44	.43	.42	.41	.40	.39	.38	.37
15.00	.36	.35	.34	.33	.32	.31	.30	.28	.27	.26
16.00	.25	.25	.24	.24	.23	.23	.22	.22	.21	.21
17.00	.21	.20	.20	.19	.19	.18	.18	.17	.17	.16
18.00	.16	.16	.15	.15	.15	.15	.15	.15	.15	.14
19.00	.14	.14	.14	.14	.14	.14	.13	.13	.13	.13
20.00	.13									

3-22

Data for **MEHLON TRUCKING**
TYPE III 24-HOUR RAINFALL= 5.5 IN
Prepared by DOCE ASSOCIATES
HydroCAD

SUBCATCHMENT **PHASE V**

PEAK= 8.57 CFS @ 12.01 HRS, VOLUME= .57 AF

ACRES	CN	
2.70	74	grass

SCS TR-20 METHOD
TYPE III 24-HOUR
RAINFALL= 5.5 IN
SPAN= 10-20 HRS, dt=.1 HRS

Method	Comment	Tc (min)
TR-55 SHEET FLOW	**AB**	4.1

Grass: Dense n=.24 L=90' P2=3.5 in s=.33 '/'

SUBCATCHMENT 5 RUNOFF PEAK= 8.57 CFS @ 12.01 HOURS

HOUR	0.00	.10	.20	.30	.40	.50	.60	.70	.80	.90
10.00	.12	.14	.15	.17	.19	.21	.23	.25	.27	.29
11.00	.32	.37	.44	.50	.58	.71	1.17	1.84	2.64	4.16
12.00	8.50	6.07	4.07	3.21	2.33	1.50	1.21	1.12	1.02	.92
13.00	.83	.79	.77	.74	.72	.69	.67	.64	.62	.59
14.00	.57	.55	.54	.53	.52	.50	.49	.48	.47	.45
15.00	.44	.43	.41	.40	.39	.38	.36	.35	.34	.32
16.00	.31	.30	.30	.29	.29	.28	.27	.27	.26	.26
17.00	.25	.25	.24	.23	.23	.22	.22	.21	.20	.20
18.00	.19	.19	.19	.19	.19	.18	.18	.18	.18	.18
19.00	.18	.17	.17	.17	.17	.17	.17	.16	.16	.16
20.00	.16									

APPENDIX #4

By ____ Date 2-19-90 | WEHRAN ENGINEERING Engineers & Scien | Job No. ____

Chkd. by ____ Date 2/21/90 | Sheet No. 1 of 4-1

Subject BLASTING

A. BLASTING HAS BEEN OCCURING ALTERNATE SATUR
BLASTING LOCATED ≈700' FROM EXISTING BLDGS.

B. DISTANCE TO EXISTING BUILDINGS / STRUCTURES FC
PROPOSED BLASTING
KINGS RD ≈ 400'
POWERLINES ≈ 700'

C. PEAK PARTICLE VELOCITY LIMITS (MAX) FOR GROUN
VIBRATION WHEN DISTANCE FROM BLASTING SITE
= 301 - 5000' ⟹ 1.00 inch/sec

D SCALE DISTANCE EQUATION WHEN DISTAN
FROM BLASTING SITE = 301 - 5000'

$$W = \left(\frac{D}{55}\right)^2$$

W = max weight of explosives that can be detonated w/i 8 ms

D = distance to site

$$W' = \left(\frac{400}{55}\right)^2 = 53\#$$

Oversized documents in original court file